

IV. FEP WORK PLAN 1999-2000

In the fiscal year 1999-2000 the Agency's FEP funded eight projects at a cost of \$130,000. In addition to granting FEP funds to organizations throughout the Russian River watershed, the Agency conducted eight research and restoration projects using internal staff and funding. These internal efforts focused on restoring degraded habitats, developing best management practices at Agency facilities, and assisting other resource agencies in the basin. The locations of FEP projects are shown on Figure 1. Projects sponsored by FEP in the 1999-2000 Work Plan are discussed below and are grouped by FEP grant projects funded to organizations and Agency-initiated projects. The information provided for each project includes a brief project description and project status.

FEP GRANTS

1. HOOD MOUNTAIN REGIONAL PARK: SLIDE #2 REPAIR IMPLEMENTATION

Description: The purpose of the Hood Mountain Regional Park: Slide #2 Repair Implementation Project is to reduce the delivery of fine sediment to Santa Rosa Creek from an eroding road adjacent to the stream. The portion of Santa Rosa Creek within Hood Mountain Regional Park provides valuable spawning and rearing habitat for steelhead. During the winter of 1996-97 a landslide on Hood Mountain Trail, adjacent to Santa Rosa Creek, displaced over 300 cubic yards of material into the stream. The Agency granted FEP funds to Sonoma County Regional Parks in 1998 for the development of engineering plans to stabilize the slide. These engineering plans specified a comprehensive effort to repair the cut slope, road surface, and fill slope gullies. The budgeted cost to the Agency to repair the slide was \$20,358.

Status: Repair of Hood Mountain Regional Park Slide #2 was delayed approximately two years. Final grading plans were completed in May 2001 and construction was completed in fall 2001. Slide #2 repairs consisted of a "K-rail" at the base of the slope to stabilize the landslide, recontouring the dirt road with rolling dips to redistribute overland runoff and reduce sediment into Santa Rosa Creek, and permanent silt fences and gravel filters below the slide to prevent erosion. The repair has prevented 90 cubic yards of sediment from entering Santa Rosa Creek.



Silt fence prevents further hillside erosion

2. GREEN VALLEY CREEK RESTORATION

Description: The Green Valley Creek Restoration project improved habitat conditions for steelhead and coho salmon at two sites along Green Valley Creek by reducing streambank erosion. Green Valley Creek is one of the few tributaries in the Russian River watershed that supports a

self-sustaining, although diminished, population of threatened coho salmon. In 1996, Trout Unlimited and CDFG constructed two streambank stabilization projects on the Thiessen and Bruno properties; however, both projects did not perform as intended and continued to deliver substantial amounts of fine sediment to the creek. Dragonfly Stream Enhancement, in conjunction with the landowners and funding from the Agency, repaired both projects. The budgeted cost for labor and materials to the Agency was \$6,657.

Status: Restoration along Green Valley Creek at the Thiessen and Bruno properties were completed. On the Thiessen property, the top of an eroding bank was sloped back while the toe was armored with 24-inch boulders and a willow mattress. Instream logs were added to improve pool habitat for fish. Disturbed banks were restored with native grass seed and riparian plants. On the Bruno property, boulders and filter fabric were used to stabilize the eroding bank. Log structures were added to enhance fish habitat at an existing pool. Also, non-native vegetation was removed from an adjacent site and replaced with native willows and other riparian tree species.



Thiessen property before and after restoration

3. HOWELL CREEK LIVESTOCK EXCLUSION FENCING AND RIPARIAN ENHANCEMENT

Description: The Howell Creek Livestock Exclusion Fencing and Riparian Enhancement project excluded cattle from the riparian zone along Howell Creek, a tributary of the Russian River, Mendocino County. A 1998 stream inventory conducted by CDFG indicated that riparian vegetation and stream channel conditions were degraded due to unrestricted cattle grazing in a 4,000 foot reach of Howell Creek. This section of stream provided marginal habitat for steelhead. Healthy riparian vegetation is necessary to improve the condition of the banks and bed in this reach. This project included the construction of barbed wire fencing, development of off-stream water sources to eliminate the intrusion of cattle into the creek, and planting native riparian vegetation. The budgeted cost to the Agency was \$14,232.



Howell Creek cattle enclosure fencing

Status: The California Conservation Corps and CDFG completed the Howell Creek enhancement project in 2000. Approximately 8,400 feet of

fencing was installed on both sides of the creek to protect 4,000 linear feet of creek. Also, 2040 native plants were planted along the creek to enhance riparian habitat. During a site visit on July 25, 2001 most of the creek was dry; however, young steelhead and foothill yellow-legged frog, a CDFG Species of Concern, were observed in two pools within the enhancement area.

4. INVASIVE PLANT SPECIES IN THE RUSSIAN RIVER: INFLUENCE ON NATIVE BIOTA AND EFFECTIVE METHODS FOR CONTROL AND RESTORATION

Description: The purpose of this project is to study the effects of and management options for two exotic plant species occurring in the Russian River watershed. The rapid spread of giant reed and periwinkle are threatening the integrity of the Russian River's biological community. In 1998, the Agency granted FEP funds for the initial phases of research into the spread of these exotics. To expand the research, Circuit Rider Productions, Inc. (CRP) and Sonoma State University will continue ongoing experiments and initiate new investigations. The study would: 1) determine the influence of giant reed and periwinkle on the composition of native riparian vegetation and invertebrates along the Russian River, 2) evaluate the response of aquatic insects to native and non-native plant litter deposited in the mainstem and tributaries, 3) identify the most effective methods for eradicating giant reed, 4) develop techniques for restoring vegetation in previously invaded riparian areas, 5) map the distribution of giant reed in tributary streams, and 6) educate the public about giant reed and coordinate and train volunteers for giant reed removal and follow-up restoration projects. The budgeted cost for labor and materials to the Agency was \$58,000.

Status: The status of this multi-faceted project is as follows:

1) Exotic plant species influence on invertebrates: Overall beetle and spider abundance were significantly lower in giant reed patches compared to other patch types. Other non-native patch types were associated with greater arthropod abundance than giant reed, indicating that non-native plants may differ in their effects on arthropods. Also, beetle species richness was lower in periwinkle patches than in native plant patches or in bare ground.

2) Aquatic insect response to plant litter: U.C. Berkeley conducted the study on the feeding preference of aquatic insects for native vegetation or giant reed. The study



indicated a significant preference for native vegetation. This suggests that the food chain for higher animals is altered in giant reed dominated areas.

3) Giant reed eradication methods: Experimental trials indicate that herbicide and tarping are highly effective control methods, and that removing giant reed allows for rapid natural regeneration of invaded sites.

4) Riparian restoration techniques: CRP is currently analyzing data from this study.

5) Map the distribution of giant reed: A basin-wide mapping and GIS program will be completed in fall 2001. This program will track giant reed populations, prioritize sites for restoration, and monitor project success.

6) Public education: CRP has provided several workshops and technical sessions to local communities, landowners, and environmental groups regarding giant reed on appropriate techniques for restoring native riparian habitat in areas where giant reed has been removed.

5. PIERCE'S DISEASE RIPARIAN MODIFICATION

Description: The purpose of the Pierce's Disease Riparian Modification project was to investigate methods of controlling Pierce's disease, while maintaining a viable riparian community. This disease attacks cultivated grapes and is transmitted by insects (e.g., sharpshooters) that inhabit riparian vegetation. The project involved the selective removal of sharpshooter host plants such as periwinkle, Himalayan blackberry, and wild grape. Non-targeted plants were not removed, including native riparian trees and most shrubs. Vegetation was removed using hand labor and herbicides. In areas where vegetation was removed, native trees were planted to provide vegetative cover and to provide habitat for birds, small mammals, as well as to provide shade and recruitment of woody debris into the creek for fish. Implementation of this project began in 1998-1999 with the removal of riparian understory vegetation. The budgeted cost to the Agency in 1999-2000 was \$2,322.



Sharpshooter

Status: In 1999-2000 the removal of targeted riparian understory plants was completed in the study area. Alexander Purcell and Joe McBride from the Division of Insect Biology, University of California, Berkeley conducted insect monitoring for three years. Insect trapping found a 50 percent reduction in sharpshooters in riparian managed areas in comparison with undisturbed riparian areas. In addition, the reduction in sharpshooters was 70 and 99 percent at two other study sites located in Napa Valley. This project has shown that selective removal of vegetation can control an insect vector of Pierce's disease while maintaining riparian habitat.

6. RUSSIAN RIVER CLEAN-UP

Description: For the past eleven years, the Sequoia Paddling Club has spearheaded the Russian River Clean-up project, which annually removes enormous quantities of debris and garbage. The Russian River receives tremendous visitor usage during the summer months and is subject to litter and debris accumulation. Sequoia Paddling Club was responsible for organizing volunteers and interested parties for the clean-up crews. The budgeted cost for labor, materials, and transportation to the Agency was \$8,700.

Status: In summer 1999 several hundred volunteers participated in the annual clean-up. The event covered 53 miles of the Russian River between Cloverdale and Jenner. The collected debris and garbage was sorted for recyclable materials and hauled away. The Agency provided garage bags and gloves for the volunteers and trucks to transport the garbage and recyclable materials.

7. MISCELLANEOUS PROJECTS CONTINGENCY FUND

Description: The Miscellaneous Projects Contingency Fund provides a source of expertise and materials for smaller projects that are not included in the current FEP. There are a large variety of small non-profit groups (e.g., school programs and local environmental organizations) implementing effective fishery restoration projects in Sonoma County. The projects conducted by these groups are often on a relatively short time frame and their plans have not been finalized prior to the completion of the Agency's annual FEP Work Plan. This fund allows the Agency to provide assistance to small groups during the current fiscal year. Generally, costs associated with projects assisted by this fund are minor.

Status: The Agency supported the following miscellaneous projects:

Austin Creek Restoration: The Agency funded the Austin Creek Restoration project and was implemented by Forest, Soil & Water, Inc. This project involved enhancing fish habitat along approximately 2,500 feet of creek at the Cazadero Performing Arts Camp. Restoration of stream and riparian habitat included installation of five boulder wing deflectors, seven log/root wad structures, three willow baffles, and native plants. The budgeted cost to the Agency was \$14,730.



Austin Creek with log

Riparian Habitat Guide: The Agency funded the revision and reprinting of the Riparian Habitat Guide. CRP managed the publication of the guide. The revisions included updating the guide and converting the guide to the Quark publishing program to improve the visual quality. The budgeted cost to the Agency was \$3,600.

FEP AGENCY PROJECTS

8. TEMPERATURE COLLECTION

Description: Stream temperature data is needed in order to determine which streams are within the temperature range suitable for salmonid spawning and juvenile rearing. This project is conducted in collaboration with CDFG and Mendocino County Water Agency. Because environmental conditions vary annually, an accurate depiction of stream temperature requires data collection in multiple years. Data loggers are deployed each year during the spring and are recovered in the fall. Temperature data loggers have been placed annually in streams prioritized by CDFG since 1996. The Mendocino County Water Agency compiles all temperature data collected by the different agencies into a single database.

Status: In spring 2000 Agency staff re-installed the 31 temperature data loggers previously established at stations along the mainstem of the Russian River and several tributaries. Also, an additional data logger was installed along Brush Creek. Agency staff is currently analyzing information from data loggers collected in the fall 1999. The results of this study will be used to develop salmonid enhancement projects, such as revegetation along creeks to provide shade and decrease water temperatures.

9. BIG AUSTIN CREEK RESTORATION

Description: The purpose of the Big Austin Creek Restoration project is to restore salmonid habitat that has been degraded by historic mining upstream of the site. The project includes reconstructing 1,300 feet of degraded channel by stabilizing the banks and planting riparian vegetation. This project is in its third year of implementation. Beginning in 1997 a hydrological study of the site was completed. Then in 1998 restoration work included bank stabilization, placement of instream cover, and construction of willow baffles.

Status: Work conducted under the 1999-2000 Work Plan, the third year of work, included additional streambank stabilization and riparian vegetation planting. Minor repairs were made to a previously restored landslide. Also, a willow wall was constructed at an eroding stream bank. Restoration efforts from the previous year are enhancing salmonid habitat and young steelhead were observed in two pools in the project area.



Juvenile steelhead and California roach over-summer in scour pool along Big Austin Creek

10. COPELAND CREEK STREAM RESTORATION

Description: The purpose of the Copeland Creek Stream Restoration project is to restore riparian and salmonid habitat along approximately 6,000 feet of Copeland Creek between Roberts/Pressley Road and Petaluma Hill Road, located east of Sonoma State University. Grazing pressure has limited vegetation establishment primarily to non-native grasses and forbs, a stand of non-native eucalyptus, and few oaks and other native trees. Restoration of this section of creek will stabilize banks, decrease creek sediment load, and improve habitat for steelhead (as well as other native fish and wildlife). The project involves constructing cattle enclosure and other types of fencing,

recontouring heavily eroded creek banks, and revegetating with native riparian species. This project will be completed in phases over a 3-4 year period.

Status: The first phase of the project was completed in the summer and fall 1999. This phase included restoring the upper one-third of the site. Approximately 1,000 feet of stream was recontoured to stabilize eroding creek banks. Willow baffles (i.e., rows of living willow sprigs) and rock boulders were placed along the base of some banks for further protection from floodwaters. The upper banks were revegetated with approximately 1,000 native riparian plants. Also, the installation of 7,600 feet of cattle exclusion and monument fencing was completed around the upper two-thirds of the project area. Restoration of the remaining 5,000 feet of degraded creek will be completed in following years.



Volunteers install plantings at Copeland Creek

11. NEIGHBORHOOD STREAM CLEAN-UP

Description: Neighborhood Stream Clean-up projects are conducted to augment the Agency's creek restoration efforts and increase community involvement and awareness of stream and riparian habitats. Community involvement is critical to the long-term success of restoration efforts, particularly for streams in urban areas that are subject to litter and debris accumulation. The Agency assists clean-up event organizers with the coordination of other agencies and local groups. Clean-up events are conducted annually and are on-going.

Status: In 1999-2000 the Agency coordinated stream clean-up projects at six creeks. The Agency also provided gloves and bags for volunteers and trucks to transport debris. Clean-up events were held at Spring, Santa Rosa, Cotati, Matanzas, Steele, and Colgan creeks. Workers included Agency staff, Americorps crews, high school students, and local groups and neighbors. The clean-up along Santa Rosa Creek between Santa Rosa Avenue and Willowside Avenue removed approximately five cubic yards of materials from the creek. This is substantially less litter than in past years, most likely due to increased clean-up efforts.

12. MIRABEL INFLATABLE DAM / WOHLER POOL FISH SAMPLING PROGRAM

Description: The Mirabel Inflatable Dam impounds the Russian River and forms the three-mile-long Wohler Pool. The inflatable dam is operated in the summer when municipal water use is highest and deflated in the winter when no longer needed to meet demand. Within the impounded reach, water depth is increased and current velocity is decreased. These changes in the natural hydrology of the river may potentially alter fish species composition, distribution, and abundance. The Agency is studying the effects of the inflatable dam operation on the life history of steelhead, coho, and chinook salmon.

Status: This fish-sampling program has several ongoing and developing components that will be conducted for at least five years. The following is a summary of the program results described in the *Results of the Sonoma County Water Agency's Mirabel Inflatable Dam/Wohler Pool Reconnaissance Fish Sampling Program*.

Water Quality: Temperature data loggers were placed along the length of Wohler Pool and at various depths to determine the water temperature of the pool. Water temperature profiles were also recorded at several locations within and above the pool on a bi-weekly basis. The temperature profile study indicated that Wohler Pool does not become thermally stratified during the summer. Temperature studies will be expanded during the next five years.

Gravel Bar Grading: The Agency annually grades gravel bars above and below the inflatable dam before it is inflated. This grading has the potential to increase turbidity and sediment input into the river. Best Management Practices were developed to reduce or avoid potential impacts from gravel grading. In addition, turbidity meters will be installed above and below grading operations to better monitor turbidity levels.

Smolt Emigration: The slower current in Wohler Pool may delay emigrating smolts (young salmonids). This study measured the time required for steelhead smolts to move through the pool. Marked smolts were released upstream, recaptured below the dam, and the time recorded to travel across the pool. There were insufficient recaptures to determine smolt migration rates. Smolt numbers will be increased in future studies.

Adult Upstream Migration: This study evaluates the effectiveness of the two fish ladders located at the inflatable dam. Underwater video cameras were installed at the upper entrance of the ladders and continuously recorded fish movement from May 20 through November 16. These cameras proved to be an excellent method to assess fish passage through the ladders. Also, snorkel surveys were conducted below the dam to determine if adult salmonids were delayed due to the dam. No adult salmonids were observed indicating that adults used the fish ladders.



Fish ladder at Mirabel Rubber Dam

Predator Population Assessment: The Wohler Pool may concentrate predatory fish that prey on young salmonids. An electrofishing boat was used to sample the predator population in Wohler Pool. Thirteen species of fish, including 716 individuals, were captured. Electrofishing proved to be an excellent method for sampling fish in Wohler Pool and will be used for a five-year monitoring program.

13. RUSSIAN RIVER BASIN COHO AND STEELHEAD POPULATION MONITORING

Description: In conjunction with CDFG and NMFS, the Agency is planning a Russian River basin-wide monitoring program to determine long-term trends in salmonid abundance. Coho and

steelhead populations in the Russian River basin have decreased dramatically over the last 100 years. However, comprehensive surveys have never been conducted in the basin making it difficult to document the decline or accurately track recent population trends. Streams throughout the Russian River watershed will be sampled annually using a variety of methods including direct observation (snorkeling), trapping, and electrofishing. While the program will generate indices of abundance for all salmonid life stages (e.g. juveniles, smolts, and adults), we will focus primarily on obtaining population estimates for juveniles during late summer and fall. After developing a study plan, survey methods at selected sample sites will be field tested for two years before adopting a final plan.

Status: During the first year of this project electrofishing surveys were conducted in Santa Rosa Creek. These surveys were used in developing a preliminary fish sampling protocol that will be further tested next year.

14. RUSSIAN RIVER ESTUARY MONITORING PROGRAM

Description: The Russian River Estuary Management Plan was developed to monitor the effects of breaching the mouth of the Russian River located near Jenner. The sandbar at the mouth of the Russian River estuary has been artificially breached to prevent upstream flooding since 1968.



Russian River mouth

Artificial breaching dramatically changes water quality and may negatively impact some species of fish and invertebrates. In 1992 and 1993, Sonoma County and the California Coastal Conservancy conducted a study to identify the adverse effects of breaching. The Management Plan includes monitoring the effects of river mouth breaching on water quality, invertebrates, fish, and harbor seals. Water quality is monitored continuously and fish and invertebrates are sampled immediately before and after breaching events throughout the summer. Continuous water quality data is collected using automated samplers and data loggers. Fish and invertebrates are sampled

using beach seines and bottom trawls. In addition, the abundance and behavior of harbor seals at the mouth of the estuary are monitored frequently. In April 1995, the responsibility for implementation of the Management Plan was transferred to the Agency.

Status: Summer and fall 1999 was the fourth year of a five-year study to evaluate sandbar breaching at the Russian River mouth. The four-year study has shown that the present program of artificially breaching the estuary has no apparent negative impact on the aquatic habitat of invertebrates, fish, and seals. The inhabitants of the estuary are adapted to an environment that naturally alternates between tidal estuary and coastal lagoon.

15. FISH RESCUE ACTIVITIES

Description: Concerned about the survival of threatened steelhead, coho, and chinook salmon, the Agency performs annual fish rescue operations to remove sensitive species from the Agency's infiltration ponds. As part of its water supply and transmission system, the Agency operates seven infiltration ponds adjacent to the Russian River at the Mirabel and Wohler collection facilities. During flood events, river water floods the levees around the ponds. Fish that enter during floods become trapped when the water recedes. When water levels recede enough to allow for safe access and efficient capture, FEP staff use beach seines repeatedly to capture all fish in the ponds. The fish are identified, counted, and released immediately into the Russian River. Also, the Agency has made several modifications to facilitate fish rescues, including construction of deep-water refugia in infiltration ponds to reduce stress and predation of impounded fish and breaching a levee at a pond to allow fish to return to the river naturally.



Rescued steelhead

Status: Fish rescue efforts at the Wohler infiltration ponds occurred on four occasions in winter and spring 1999. Approximately 600 fish were captured from the Wohler infiltration ponds during the fish rescue efforts. A total of 61 salmonids and 539 other native and non-native fish species were captured and immediately released to the Russian River, including 1 adult steelhead, 32 wild steelhead juveniles, and 29 juvenile hatchery steelhead.